REMARKS

In view of the foregoing amendment to Claim 38, Applicants submit that such claim is no longer subjection to rejection under 35 U.S.C. §112, second paragraph. Reconsideration is therefore requested.

The rejections of Claims 26, 28-30, 36-38 and 43-45 as being unpatentable over Kraemer in view of Wilber under 35 U.S.C. §103(a), of Claims 35 and 39 as being unpatentable over Kraemer in view of Wilber and further in view of Yasuhara under 35 U.S.C. §103(a), of Claim 40 as being unapatentable over Kraemer in view of Wilber and further in view of Ewing under 35 U.S.C. §103(a), and of Claims 41 and 42 as being unpatentable over Kraemer in view of Wilber and further in view of Mitake and Ewing under 35 U.S.C. §103(a), are each respectfully traversed. Reconsideration of each of these rejections is requested in view of the foregoing amendments and/or the following comments.

Initially, Applicants request that their undersigned representative be permitted a personal interview with the Examiner prior to the issuance of any further written action assuming, of course, that the issues now remain. Given the length nature of the prosecution of this case, they are hopeful that any such face-to-face meeting may serve to eliminate or at least more sharply focus the issues.

Applicants incorporate herein by reference their previous comments regarding the differences between, on one hand, the Kraemer pump, the Wilber

injector and the Yasuhara teachings, particularly as found in the papers filed May 3, 2006, December 1, 2006 and August 22, 2007.

Claims 26, 28 and 35 have been amended to reflect features shown in Figs. 15 and 16 and described at page 55, lines 4-7, page 56, lines 12-25 and page 58, lines 7-18 of the specification. Once again, as the Kraemer and Wilber documents are central to all rejections, Applicants will again focus on them. These documents or their foreign equivalents were also cited in corresponding EP applications, one of which (application No. 04016691.0) has been patented as EP Patent No. 1477665 and whose claims generally correspond to Claims 43-53 herein and the others of which (application No. 05027962.9) has been patented as EP Patent No. 1657432 and whose claims generally correspond to Claims 36-41 herein, as the Examiner can verify based upon the foregoing data.

Applicants further note that their pump uses an intake valve that functions as a spill valve with the closing timing of that valve being determined directly by the plunger rod. In the Kraemer pump, when an electromagnetic mechanism is powered-on, an intake valve is opened, and when the electromagnetic mechanism is powered-off, the intake valve is closed. But in the present invention, when an electromagnetic mechanism is powered-on, an intake valve is closed, and when the electromagnetic mechanism is powered-off, the intake valve is opened.

In the European prosecution, the differences between Kraemer teachings (referred to therein as well as herein as "Bosch") vis-à-vis the present invention

were illustrated in an attached sketch which shows there is a line "current" when current is passed to the coil of the intake valve 9 in Bosch. The line "plunger stroke" depicts the movement of the plunger 3 which corresponds to the movement of a cam as shown in the line "cam". The coil of the intake valve is provided with current when the plunger reaches the top dead center (TDC). Since the coil is provided with current, the engaging member pushes the valve body 10 away from the seat 12 and opens the intake valve. Then, the descending plunger performs an intake of fuel into the pressurizing chamber. When the plunger reaches the bottom dead center (BDC), the current running through the coil is maintained. Thereby, the intake valve is kept open in sprite of a rising pressure within the pressurizing chamber created by the rising plunger. Due to the open intake valve, fuel leaks back to the intake line 8.

At that point in time, when the control unit is configured to stop the leakage, the current running through the coil of the valve is turned off. In this situation, the valve body 10 is pushed toward the seat 12 due to the force of the spring 11 and the pressure of the fluid in the pressurizing chamber. After the closing of the valve, a discharge stroke starts as shown in the Bosch (or Kraemer) document.

The disadvantage of the Bosch (Kraemer) approach is that the electromagnetic operating mechanism 9 is only turned off, when fuel discharge is desired. If the amount of the discharge fuel is small, the energizing time to the coil is long and the electric power consumption is high.

In contrast, the present invention provides a high-pressure fuel supply pump with an intake valve that can be controlled so that the amount of discharged fuel can be controlled while the electric power consumption is relatively low compared to known electrically controlled intake valves. This has been achieved by employing an engaging member that is at a second position, when an electromagnetic operating mechanism is turned on. When the engaging member is at the second position, the valve body is opened and closed due to a pressure difference between upstream and downstream of the valve body as can be best understood again by referring to the attached sketch where the present invention's differences from Bosch (Kraemer) are exemplified.

A main difference between the two figures is in the line "current". That is, current is turned on in the present invention, when it is off in the Bosch (Kraemer) prior art and the current is turned off in the present invention when it is turned on in that prior art.

When the current is not passed to the coil 200 of the valve of the present invention, the intake valve 5 is kept at an open position by a force of the spring 202 and a differential pressure between the upper stream and the down stream of the intake valve. This open position is not only kept during the descending of the plunger 2 (the plunger 2 moves toward the bottom dead center (BDC)), but it is also maintained while the plunger 2 rises (i.e., the plunger 2 moves towards the top dead center (TDC). When the plunger 2 rises and the intake valve is open, fuel leaks through the intake valve, as can be seen in the attached sketch.

If the current passing through the coil 200 is turned on during the leakage of the fuel as described above, the engaging member 201 is pulled back against the resistance of the spring 202. Thereby, the intake valve 5 closes due to the turned on electromagnetic operating mechanism, the force of the spring 51, and the pressure of the inside fluid. After the valve closes, a discharge stroke starts as shown in the attached figure. When the plunger reaches the top dead center, the current is turned off again. When the plunger moves towards the bottom dead center, the open position of the intake valve is resumed again due to the force of the spring 202 and the differential fluid pressure.

By comparing the two lines "current", it can be readily seen that in the case of Bosch (Kraemer), the current is turned on longer than in the case of the present invention, which means that the present invention leads to a significant lower power consumption for valve operation. Especially, if the amount of the discharged fuel is small, the power consumption to operate the valve is also small. Therefore, the intake valve according to the present invention possesses significant advantages, particularly concerning short discharge periods. The Kraemer (Bosch) pump did not address power consumption at all that is needed to operate the intake valve.

The teachings of the Wilber document are of no material benefit in bridging the differences between the Kraemer pump and the claimed invention herein. In Wilber, a control valve 78 as well as an intake valve 26 are required for operation. Wilber and Kraemer work essentially according to the same

principle. More specifically, the Wilber system is a unit injector whereas the pump of the present invention is a common rail type pump with the pressurized fuel is being supplied to a common rail type pump with the pressurized fuel being supplied to a common pipe which supplies fuel to a plurality of injectors for the respective cylinders located along said pipe. Unit injector system pumps do not possess such a common rail, but, to the contrary, inherently want to avoid a high pressure pipe capable of providing even higher supply pressures. In this connection, in the Wilber system, the fuel from the high-pressure pump entering via passage 30 into the control chamber 18 merely serves to control the pressure of the injector 4 and is never injected into the combustion chamber. In other words, this system does not have a discharge passage 11 with the discharge valve 6 forming the connection to the common rail 53 shown in Fig. 3 of this application under examination herein. In no way, absent impermissible hindsight, would the teachings in the Wilber document provided any motivation whatsoever to modify the structure of the pump shown therein from a unit injector type to a common rail type, particularly as such modification would have resulted in a loss of the inherent advantages offered by the unit injector system pump, i.e. a very high pressure and a simple structure as compared to common rail system, where the driving energy provided via the cam has to be provided only in the range of injection.

Thereby, a rejection of any of the claims in this application based wholly or in part in a combination of the Kraemer (Bosch) and Wilber teaching fails to

state a *prima facie* case of obviousness. Accordingly, early and favorable action is earnestly solicited.

If there are any questions regarding this amendment or the application in general, a telephone call to the undersigned would be appreciated since this should expedite the prosecution of the application for all concerned.

If necessary to effect a timely response, this paper should be considered as a petition for an Extension of Time sufficient to effect a timely response, and please charge any deficiency in fees or credit any overpayments to Deposit Account No. 05-1323 (Docket #056205.48558C1).

Respectfully submitted,

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